Modular Amplifiers

Power Vector Modular Amplifiers V35, V60, V100, V150, V250

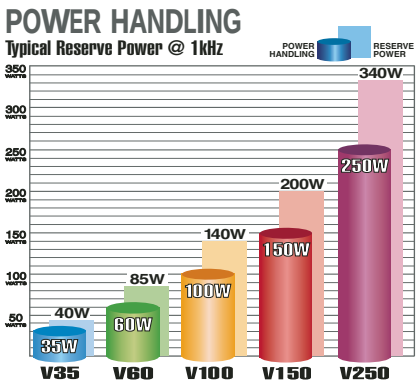
WALL-MOUNTABLE version on Page 38

MIXER version on Page 46

Bogen's **Power Vector** modular input amplifier series offers a wide range of power levels from which to choose from, with five models ranging from 35W to 250W. The amplifiers are designed to work with both high- (70/25V) and low-impedance (4/8-ohm) speaker systems. Each model includes eight module bays for input modules and allows up to four levels of priority between modules. Two module bays are also capable of accepting signal-processing output modules. Each input channel has an associated signal/clip LED for signal status. An 11-segment LED output meter monitors output signal level, which is controlled by a motorized master volume control that can be remotely controlled. Modules required, but sold separately.

Product Features:

- 5 models ranging from 35W to 250W with a large power reserve
- Capable of handling 70V, 25V, 8-ohm, and 4-ohm speaker loads
- 8 input module bays (modules sold separately)
- Wide selection of advanced input modules
- 2 module bays capable of handling signal-processing output modules
- 4 levels of priority between modules
- 11-segment LED output level meter with Peak and Average switch
- Motorized master volume control that can be remotely operated (requires RVCP)
- Bass and treble controls
- Two-color LED for each channel indicates signal active/signal clipping
- Lockable switch permits user to select either transformer-coupled outputs or a direct low-impedance output
- Mute control mutes all audio from the mixer section of the amplifier
- Bass and treble control bypass switch
- 125 Hz Lo-cut feature
- 2 rack spaces high (3-1/2")
- Signal-processing insert jacks allow external equipment to be inserted between the pre-amp output and the power amp input
- Pre-EQ unbalanced buffer output signal "post" all unit controls, but "pre" any external signal-processing equipment connected
- Grounded, unswitched AC convenience receptacle with a 500W maximum capacity provided for external equipment
- Security cover to protect volume, bass, and treble controls (PVSC) (sold separately)
- Module security cover prevents tampering with module controls (PVMC) (sold separately)
- Rack mountable (mounting kit RPK87) (sold separately)



Signal-Processing Modules

When signal-processing output modules are installed into the Power Vector's last two module bays, they automatically insert themselves into the mix bus signal path leading to the power amplifier stage. When two of these output modules are installed, their effects are cascaded with the second to last bay's module processing the signal first and then passing it to the module in the last bay. Two benefits are gained by this innovation: (1) the effects insert jacks are still available for use by external processing equipment, (2) the signal-processing output modules act on the signal on the raw mix bus signal before any other user controls, like volume, bass, and treble can affect it. This then ensures that signal level dependent processors, such as the CMP1R Compressor / Limiter and the ANS1R Ambient Noise Sensor modules, perform as intended regardless of front panel control changes.

Remote Volume Control

The master volume control is motorized. By using a motor to physically move the control knob, a new level of remote control adjustability is achieved.

Regardless of where the master volume control is set on the amplifier, the remote can move it, up or down. Since the remote control signal is now the drive signal to the motor, noise on the remote control leads cannot mix in with the amplifier signals. This gives the Power Vector a fully functional and clean way of remotely controlling overall system level.

Traditionally, remote volume control was accomplished by having the remote control vary an analog control signal to an opto-resistor in the amplifier. This opto-resistor would further attenuate the signal level in the amplifier, based on the remote control setting. This approach has two drawbacks: (1) the maximum volume that can be achieved by changing the remote control was limited by the master volume control setting on the amplifier, or vice-versa depending on how the amplifier was designed. The remote could lower volume, but could not further increase it, (2) the control signal, because it is analog, is vulnerable to noise. If a 60 Hz hum was picked up by the long remote volume leads, it could cause the opto-resistor to modulate the volume level at the hum frequency.

Accessories

PVSC
Power Vector Security Cover

RVCP
Remote Volume Control Panel

RPK87
Rack Mounting Kit

PVMC
Module Security Cover

MODULES

Input & Signal Processing Modules- See Pages 37 & 38

ALL MODULES SOLD SEPARATELY

Technical Specifications, Dimensions, and Weights can be found on Page 79

Advanced Input Modules

Input Modules

(Output Modules on Page 38)

Bogen's advanced plug-in input modules provide a wide range of functions to support a variety of applications. These modules support different signal-source requirements, including the ability to interface to balanced and unbalanced high- and low-level inputs, stereo or mono, telephone systems, and microphones. Shipping weight: 1 lb. each.

STEREO AUX INPUT - SAX1R

Unbalanced stereo module

- Gain/Trim control
- Bass & Treble controls
- Gate feature mutes lower priority modules
- Mutable by higher priority modules
- Variable ducking level when muted
- Fade back from mute
- Stereo-to-mono summing option
- Bus assignable
- RCA connectors

MICROPHONE INPUTS - MIC1S, MIC1X

Low-impedance, transformer-balanced microphone inputs

- Gain/Trim control
- Bass & Treble controls
- Noise gate w/Threshold & Duration control
- Limiter w/Threshold control
- 24V Phantom power
- Priority & Bus assignable
- Balanced, transformer-isolated
- Screw terminals (MIC1S); XLR connector (MIC1X)

MONO AUX INPUT - MAX1R

Unbalanced mono input module

- Gain/Trim control
- Bass & Treble controls
- Gate feature mutes lower priority modules
- Mutable by higher priority modules
- Variable ducking level when muted
- Fade back from mute
- Bus assignable
- RCA connector

MICROPHONE INPUTS - MIC2S, MIC2X

Low-impedance, electronic-balanced microphone inputs

- Gain/Trim control
- Hi-Cut/Lo-Cut controls
- Enhance control
- Noise gate w/Threshold control
- Limiter w/Threshold control
- 24V Phantom power
- Priority & Bus assignable
- Screw terminals (MIC2S); XLR connector (MIC2X)

BRIDGING INPUT - BRG1R

Daisy chain multiple amplifier inputs

- Gain/Trim control
- Ground isolated input to eliminate ground loop
- Input signal available at buffered output
- Priority assignable
- Variable ducking level when muted
- Fade back from mute
- Buffered output not muted
- Bus assignable
- RCA input and output connector

TRANSFORMER BALANCED INPUT - TBL1S

Transformer balanced AUX input

- Gain/Trim control
- Bass & Treble controls
- Transformer-isolated, dual-impedance, line level input
- Variable ducking level when muted
- Mute send & receive
- Fade back from mute
- Mute send threshold & duration adjustments
- Priority & Bus assignable
- Pluggable screw terminal connections

TELEPHONE INPUT - TEL1S

Interfaces to telephone system's loop start/ground start trunks or paging ports

- Loop start or ground start trunk interfacing
- Dry loop interface to paging ports
- Audio-activated paging in dry loop
- Gain/Trim control; Noise gate & Limiter
- Mutes lower priority modules
- Mutable by higher priority modules
- Bus assignable & Transformer-isolated
- Screw terminal connections

Accessories

PRS48 48V DC Power Supply

TONE GENERATOR - TNG1S

Multiple Tone Generator Input

- Level control
- Select 4 of 8 tones to trigger
- Burst/steady, slow whoop, siren, mechanical bell, Klaxon, night ringer, double chime, & doorbell tones
- Momentary & continuous playback modes
- Microprocessor-controlled
- Priority assignable
- Mute send & receive
- Screw terminal trigger connections

BALANCED INPUT - BAL2S

Stereo, balanced input

- Stereo, high-impedance, electronically balanced inputs
- Professional-quality, low noise performance
- Selectable gain of 0 or 18 dB
- Compatible with telephone system page ports
- Mutable by higher priority modules
- Variable ducking level when muted
- Fade back from mute
- Screw terminal connections

Accessories

MA3 Module Adapter

Adapts Modules for use with D-Series, WMA, and DPA Amps

Advanced Output Modules

Signal-Processing Output Modules *(Input Modules on Page 37)*

Bogen's plug-in signal-processing output modules automatically insert themselves into the mix bus signal path leading to the power amplifier stage when installed. Shippng weight: 1 lb. each.

RELAY INPUT/OUTPUT - RIO1S

- Transformer-isolated, balanced line-level input
- 600-ohm or 10k jumper selectable input impedance
- 8-ohm, 750mW output
- Input and output level controls
- Relay responds to selectable priority level
- External control of priority muting
- N.O. or N.C. relay contacts
- Input can be muted from higher priority modules, with signal fade back
- Output can gate with relay priority level
- Screw terminal strips
- RJ11 connection with line output and dedicated N.O. relay contact

AMBIENT NOISE SENSOR - ANS1R

- Maximum Gain control
- Ramp Speed control
- Activity Threshold control
- Ambient mic input threshold control
- Stereo Aux input (summed mono)
- Aux level input control
- Gradual fade back from mute
- Connect up to 4 sensor mics (1 included)
- Mutable input (lowest priority only)
- RCA connectors

Accessories

ANS500M
Sensor Microphone
(one included w/system)

COMPRESSOR LIMITER - CMP1R

- Compressor Ratio control
- Threshold control
- Make-up Gain control
- Bypass switch
- Unbalanced input
- Gradual fade back from mute
- Mutable input (lowest priority only)
- RCA connector

PARAMETRIC EQUALIZER - PEQ1R

- 2 full parametric bands
- Frequency control
- 'Q' bandwidth control
- Gain control
- Bass and Treble control
- Unbalanced input
- Bypass switch
- Mutable input (lowest priority only)
- Gradual fade back from mute
- RCA connector

Modular Amplifiers

Wall-Mount Power Vector Amplifiers WV100, WV150, WV250

The Wall-Mount Power Vector Series combines up to 8 modular inputs and signal-processing outputs to meet various application requirements. The amplifier's convenient and efficient wall-mount design provides a protected and accessible audio system in a permanent and inconspicuous mounting.

Product Features:

- 100, 150, and 250 watt models; each with large power reserve
- 8 module input bays, accepts up to 2 signal-processing output modules and up to 8 input modules
- Wide selection of advanced input and signal-processing output modules
- Four priority levels between modules
- 4-ohm, 8-ohm, 25V, and 70V outputs
- Secure, permanent wall mounting (in-wall with BBF or surface-mount with BBS)
- 11-segment LED output level meter registers Peak or Average output
- Adjustable output level limiter with active indicator
- Front-mounted tape output provides unbalanced signal level output
- Independent volume controls for each input
- Motorized master volume control, with optional accessory RVCP for remote operation
- External mute control
- Bass and treble controls with center detent
- 125 Hz Lo-cut switch
- Tone control bypass switch
- Optionally installable front-mounted input combo jack with 1/4" stereo phone and female XLR capabilities for connection to user-supplied modules
- Thermal, short-circuit, and overload protection
- Thermally controlled 3-speed fan
- UL and CSA listed
- Components required for installation: Door (WMAD) and Back Box (BBF or BBS), both sold separately
- Modules required, but sold separately

RACK-MOUNTABLE version on Page 36

Technical Specifications, Dimensions, and Weights can be found on Page 79

MODULES

Input Modules- See Page 37
Output Modules- See Above

Accessories

RVCP
Remote Volume Control Panel

Components

NOTE: These items are required for installation: BBF or BBS, and one WMAD.

BBF
Flush-Mount Back Box

BBS
Surface-Mount Back Box

WMAD
Front Cover/ Door

Public Address Amplifiers

Gold Seal Series Amplifiers

GS35, GS60, GS100, GS150, GS250

This amplifier series was designed with the sound contractor in mind, offering professional performance and installation convenience. Each Gold Seal amplifier offers a unique combination of built-in features, ultra-high reliability, and extensive input flexibility and input options.

Product Features:

- 35, 60, 100, 150, and 250-watt models
- 7 inputs: 4 MIC (Lo-Z), 1 AUX (Hi-Z), 1 MIC/TEL, 1 MIC/AUX
- 4-ohm, 8-ohm, 25V, 25VCT, and 70V outputs
- Dual-function, 10-band graphic equalizer (acoustic EQ/feedback control)
- True loudness contour function
- Aphex® Aural Exciter for improved intelligibility
- Automatic level control
- Switchable phantom power supply
- Variable Aux input muting
- Remote master volume control capability
- Input muting via contact on all inputs
- Voice-activated Aux muting on Tel input
- Aux fade back after Tel page
- Pre-amp out/power amp in connections
- Booster amp output connection
- Tape output connection
- Low-cut filter for Mic channels
- Thermal and overload protection
- 3-speed cooling fan (GS250 only)
- Rack-mountable w/ accessory mounting kit (2 rack spaces)
- UL and CSA listed

Rear Panel
(GS150 shown)

Amplifier Output
Terminal strip containing all the Gold Seal output taps.

Booster Out
RCA connection provides an unbalanced signal level output as a feed to other external amplifiers.

Var Mute
4 selectable levels of AUX input signal muting during TEL page.

Low Cut Switch (MIC inputs only)

Selectable Inputs
Dual function screw terminals for either balanced microphone or 600-ohm balanced input from telephone page port. Switches select mode of operation for MIC 5/TEL input and MIC 6/AUX1.

Remote Master
Screw terminal pair for connection of remote master volume control (Model GSRVC).

MIC/AUX/TEL Precedence
Screw terminal connections that allow externally controlled muting of individual inputs.

Equipment Inserts
Allows connection of external signal-processing equipment between pre-amp and power amp stages.

Tape Out
Output is not affected by master volume control or by the EQ.

AX, ALC, VOX
Variable controls for adjusting the Aphex Aural Exciter effect, the automatic level control applied to the TEL input, and the TEL input signal level trigger point for muting of Aux input.

MIC 1 to 4
Balanced XLR connectors for dedicated microphone inputs.

Phantom Switches (MIC 1 to 4)
Individual switches enable or disable phantom power to each of the 4 dedicated microphone inputs (MIC 5 and MIC 6 phantom power selection).

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

GSTRC
Tamper Resistant Cover

GSRPK
Rack Panel Mounting Kit

GSRVC
Remote Volume Control

WMT1A
Line-Matching Transformer

Dual Band EQ

The unique dual-function equalizer can be used for acoustic shaping or for feedback control.

• ***Acoustic Shaping*** - Full range equalization is provided for correcting general frequency response issues that exist in the application venue. The full audio spectrum is covered on 1-octave centers with a boost/cut of 12 dB. In this mode, the equalizer can be used to compensate for room acoustics, or to satisfy the listening preference of the user.

• ***Feedback Control*** - In this mode, the equalizer's control range is reduced to cover only the lower half of the audio spectrum (where feedback howls occur), but the individual filters are now on closer 2/3-octave spacing. This allows narrower bands of frequencies to be controlled, which is particularly useful to reduce feedback of live sources that can increase the effective loudness the system can achieve.

Variable Music Mute

This feature allows control over the level of background music (fed though the AUX inputs) heard during a telephone page announcement. The convention used to be to completely mute background music during pages. The Gold Seal amplifiers provide full muting as well as no muting and intermediate attenuation levels of –10 dB and –21 dB. After the telephone page has ended, the background music smoothly fades back to its original level for a very professional sound.

Telephone Paging Control

Input 5 serves a dual function as either a balanced MIC input or a 600-ohm balanced telephone input. The TEL input includes both voice-activated triggering for muting the AUX inputs and automatic level control for providing constant paging level. ALC compensates for different voice levels and speaking styles of the individuals using the system. Controls are provided on the rear of the amplifier to adjust trigger threshold of the voice-activated muting so that it will not falsely trigger from noise on the input. An ALC adjustment is also provided to allow control over the amount of compression applied to loud signals to keep them at a nominal signal level.

Aphex Aural Exciter

Crisp, clean, intelligible sound is the goal of every paging system. The Aphex® Aural Exciter circuit, which was originally developed for the recording industry, adds back the high frequency harmonics that are lost through the handsets and speakers. With one simple control, you can adjust the amount of high frequency content the Aphex circuit adds back until optimum intelligibility is reached.

Public Address Amplifiers

Classic Series Amplifiers

C10, C20, C10MOH, C20MOH

C35, C60, C100

These public address mixer amplifiers provide mixing of microphones, telephone, and auxiliary sources. Output jacks allow a tape recorder or an additional booster amplifier to be connected. Bogen's Classic Series Amplifiers offer high-performance, flexibility, and reliability for most applications requiring a variety of inputs.

Product Features:

- 35, 60, and 100 watt models as well as 10 and 20 watt models w/ optional built-in MOH (music-on-hold) outputs
- 4 inputs (C35/60/100 models): 1 MIC (Lo-Z), 1 AUX (Hi-Z), 1 TEL, plus 1 selectable MIC or AUX
- 3 inputs (all C10/C20 models): 1 MIC (Lo-Z), 1 TEL, plus 1 selectable MIC or AUX
- AUX muting w/ external contact closure or automatic w/ TEL
- TEL input voice-activated (VOX) mute over AUX input
- Variable threshold for voice-activated AUX mute
- Separate volume controls for each input plus overall bass and treble (C35/60/100 models) or tone (all C10/20 models)
- Outputs for 4-ohm, 8-ohm, 16-ohm, 25V, and 70V speaker systems
- Screw terminal connection for microphones
- MOH output: 600-ohm @ 1V, 8-ohm @ 1W, and output level control (MOH models only)
- No paging heard in MOH output (MOH models only)
- Input Sensitivity: 600 mV, MIC; 85 mV, AUX; 75 mV, TEL
- Thermal protection and electronic shutdown
- Output jack to connect a tape recorder or booster amplifier (C35/60/100 models only)
- Easy-to-understand and easy-to-operate controls
- Rack-mountable w/ accessory mounting kit (2 rack spaces)
- UL and CSA listed

Model	Number of Inputs	MIC precedence over AUX input(s)	Bass/Treble control	4, 8-, 16-ohm, 25V, 70V speaker outputs	MOH Output Built-in	VOX muting of AUX input (TEL input only)	Variable VOX threshold	Tape/Booster Output
C35/60/100	4 – 1 MIC, 1 AUX, 1 TEL, 1 MIC/AUX	●	●	●		●	●	●
C10/C20	3 – 1 MIC, 1 TEL, 1 MIC/AUX	●	*	●		●	●	
C10MOH/ C20MOH	3 – 1 MIC, 1 TEL, 1 MIC/AUX	●	*	●	●	●	●	

* *Treble Cut only*

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

RPK35B Rack Panel Kit for C10(MOH)/ C20(MOH) models

RPK50 Rack Panel Kit for C35/60/100 models

WMK1 In-Wall Mounting Kit for C10(MOH)/ C20(MOH)

WMT1A Matching Transformer

Utility Amplifiers

Utility Amplifier GA2

The GA2 is a rugged, compact amplifier designed to meet the requirements of continuous low-power audio applications, especially telephone line "music-on-hold" amplification; to drive monitor speakers, headphones; or as a line amplifier.

Product Features:

- 1.5-watt utility amplifier
- 1 input: AUX (Hi-Z)
- 8-ohm or 600-ohm outputs
- 200 Hz - 15 kHz frequency response
- 50 mV sensitivity
- Volume control
- 120V AC operation
- 4W power consumption
- 5-1/2 foot AC power cord included
- Wall-mountable design
- UL listed

Accessories

WMT1A Matching Transformer

Utility Amplifier GA6A

The GA6A is a dual-input amplifier with a wide variety of smaller applications including background music, relaying communication from one room to another, or sound reinforcement.

Product Features:

- 6-watt utility amplifier
- 2 inputs: 1 MIC (Lo-Z), 1 AUX (Hi-Z)
- 8-ohm, 25V, or 70V outputs
- 30 Hz - 12 kHz frequency response
- Sensitivity: .3 mV, MIC; .2V, AUX
- Thermal and over-current circuit breakers
- Adjustable tone control
- 16W power consumption
- UL listed

Technical Specifications, Dimensions, and Weights can be found on Page 79

Mono-Channel Power Amplifiers

HTA125A, HTA250A

These high-performance power amplifiers can safely drive loads continuously at full (RMS) power, in ambient temperatures of up to 120° F. Overload protection includes an electronic shutdown circuit and a thermal breaker.

Product Features:

- 125 and 250 watt models
- Designed for continuous operation at rated power, up to 120° F
- Convection-cooled
- Power MOSFET output circuitry
- Thermal protection and automatic electronic overload protection
- Hi-Z unbalanced and Lo-Z balanced or unbalanced input w/ accessory transformer (TL600)
- Internal lo-cut filter switch
- 90 dB signal-to-noise
- Input sensitivity: Hi-Z, 500 mV; Lo-Z, 100 mV (HTA125A), 150 mV (HTA250A)
- Power Consumption: 260W (HTA125A); 520W (HTA250A)
- 4- and 8-ohm, 25V and 70V outputs
- Line bridging (driving multiple amplifiers) is possible w/ an accessory transformer (TL100)
- 19" rack-mount design (3 rack spaces)

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

TL100
1:1 Bridging Transformer

TL600
600-ohm Impedance-Matching Transformer

WMT1A
Matching Transformer

Heavy-Duty Operation

The HTA line of amplifiers are designed to be workhorses. Large heat sinks and huge transformers allow these amplifiers to supply continuous, full (RMS) power to loads, even at high ambient temperatures – up to 120° F. The HTA amplifiers are convection-cooled, so they provide the ultimate in set-and-forget operation.

More amazing than the heavy-duty capability of the HTA amplifiers is the quality of the output. The frequency response will remain within +/- 1 dB and have less than 0.5% distortion over the entire audio range (20 Hz – 20 kHz). What is so special about this? The output is transformer-coupled. Few transformer-isolated amplifiers can even come close to these specifications. An enormous output transformer using proprietary coil winding techniques is what allows the HTA to reach this level of performance.

A Power MOSFET output stage completes the extremely reliable and durable performance of these amplifiers. This type of transistor does not suffer from many of the failure modes of the more typical transistors (bi-polar types). The result is an amplifier that can operate reliably at full power, continuously, in 120° F ambient temperatures and supply transformer-isolated, high-quality, full bandwidth (20 Hz – 20 kHz) audio.

Mono-Channel Power Amplifier

BPA60

The BPA60 supplies 60 watts of power amplification for professional and commercial sound systems requiring continuous high-quality sound.

Product Features:

- 60 watts
- 1 input: Hi-Z unbalanced
- Lo-Z balanced input with accessory transformer
- Input level control and lo-cut filter switch
- 8-ohm/25V, 16-ohm, 25VCT, and 70V outputs
- Sensitivity: 300mV, Hi-Z; 75mV, Lo-Z
- Resettable circuit breaker and thermal protection
- Operates with 25V and 70V systems
- 120V AC, 60 Hz, 180W @ full rated output
- Rack-mountable with accessory mounting kit: RPK53 (2 rack spaces)
- UL and CSA listed

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

RPK53
Rack Panel Kit

TL100
1:1 Bridging Transformer

TL600
600-ohm Impedance-Matching Transformer

Dual-Channel Power Amplifiers

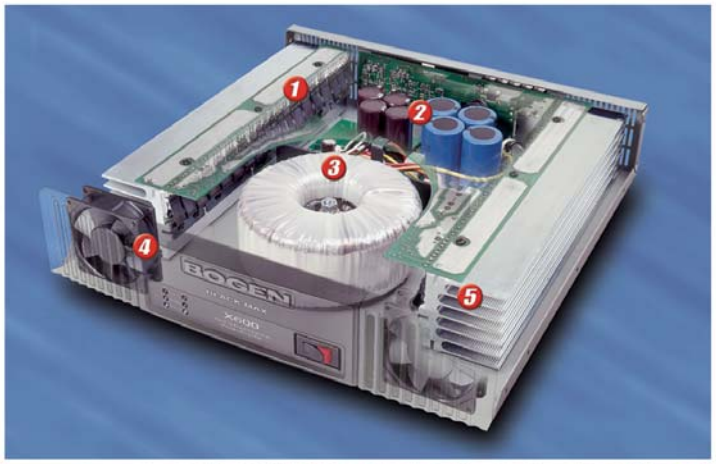
Black Max™ Power Amplifiers
X300, X450, X600

Bogen's Black Max amplifiers are designed to provide maximum performance in constant voltage speaker systems. Dual 70V transformerless outputs deliver exceptionally clean audio to speaker systems requiring two channels of audio up to 600W per channel, in a single package. High efficiency class H amplifier design and the auto-sleep feature aid in reducing power consumption on continuously-powered systems. Rear-mounted volume controls, independent low-cut filters on each input, and pluggable input terminal strips were specifically designed for the fixed install market. Built-in power sequencing for multiple Black Max amplifiers combats current in-rush problems of large audio systems. Massive power toroid and heat sinks; heavy 14-gauge chassis; patented Back-Slope™ AC voltage stabilization; clip limiters; and DC voltage, over-current, and thermal protection circuits make the Black Max both an efficient and reliable workhorse amplifier.

Product Features:

- Dual 70V amplifier channels
- 300W, 450W, or 600W per channel for 70V speaker systems
- Low noise, low distortion, and high slew rate
- High-efficiency class H amplifier design
- Transformerless direct drive outputs
- Electronically balanced high-impedance inputs
- Pluggable terminal strips for input connections
- Independent low-cut filters for each channel
- Built-in power sequencing of other Black Max amplifiers
- Pluggable terminal strip for sequencing wiring
- Rear-mounted power sequencing status indicator
- DC, overload, short circuit, and thermal protection circuits
- Clip limiting circuits for speaker protection
- Power-saving sleep mode for intermittent use applications
- Status, Signal, and Limit indicators
- Back-Slope AC voltage stabilization for dependable performance over varying AC line voltages (±10%)
- Heavy-gauge steel chassis with cast aluminum front panel
- Rear-mounted volume controls
- Mounts in 2 rack spaces (3-1/2") directly stackable without need for extra space above or below
- 2 independent, continuously variable cooling fans for dependable and quiet operation
- Easily removable front fan grilles with filters

Inside the Black Max™ X600



14 Large Output Transistors Per Channel for Extra Reliability

74,600µf of Capacitance Creates Enormous Amounts of Reserve Energy

The Black Max™ Transformer weighs in at 17 lb. with 2 kVA of Power

Two Independent Variable Speed Fans Provide for Quiet Cooling

Two Custom Extruded Heat Sinks Provide Heat Transfer from Output Transistors

Accessories

RPK86
Rear Rack Mounting Kit

Technical Specifications, Dimensions, and Weights can be found on Page 79

Dual-Channel Power Amplifiers

M-Class Amplifiers
M300, M450, M600

Bogen's M-Class amplifiers provide professional sound installers with exactly what they need from an amplifier: 3 modes of operation: stereo (4-ohm), 70V mono, dual mono (4-ohm); 2 bays for a variety of input modules; up to 600W/ch stereo (4-ohm) or 1200W of 70V mono power; massive power toroid and heat sinks; heavy 14-gauge chassis; patented Back-Slope™ AC voltage stabilization; clip limiters; and DC voltage, over-current, and thermal protection circuits.

Product Features:

- 3 Mono power levels: 600W, 900W, or 1200W for 70V speaker systems
- 3 Stereo power levels: 300W, 450W, or 600W per channel @ 4 ohms
- 3 Modes of operation to choose from: Stereo (4-ohm), Dual Mono (4-ohm), or 70V Mono
- 2 Module input bays for flexible modular input capability
- Low noise, low distortion, and high slew rate
- Professional, high-impedance, balanced stereo input module included (BAL2S)
- 3 selectable low-frequency roll-off choices
- 2x1 mixer function when in mono modes
- Insert connections for outboard equipment (in mono modes)
- Post- and Pre-EQ Output Feeds (summed mono out in stereo mode)
- DC, overload, short circuit, and thermal protection circuits
- Clip limiting circuits for speaker protection
- Power-saving Sleep Mode for intermittent use
- Status, Signal, and Clip/Limit indicators
- Back-Slope AC voltage stabilization for dependable performance over varying AC line voltages
- Recessed volume control knobs
- Mounts in 2 rack spaces (3-1/2") directly stackable
- 2 Independent, continuously variable cooling fans
- Easily removable front fan grilles with filters
- Stable into 2-ohm loads

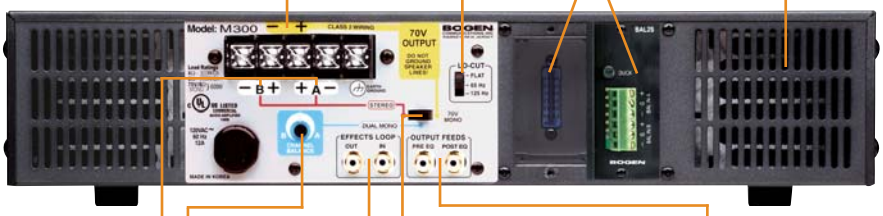
70V Speaker Output For 70V constant voltage speaker systems. Provides a single channel of amplification.

Lo-Cut Filter Switch - Select a low-frequency roll-off of 65 Hz or 125 Hz for transformer-coupled and horn speakers. Flat position allows full low-frequency performance.

Module Bay - The unit can accept one or two Bogen input modules. Each amplifier comes with a balanced, high-impedance stereo input module.

Cooling Fans - Two independent, variable-speed cooling fans respond only as needed to keep the amplifiers cool and reduce dust build-up.

Rear Panel



Low-Impedance Outputs For 4- to 8-ohm speaker loads. Unit is stable into loads as low as 2 ohms.

Channel Balance Control *(in Dual Mono operation mode)* - Allows the output level of one channel to be lower than the other channel's output level.

Effects Loop - Provides insert point for outboard signal-processing equipment when the amplifier is in either 70V Mono or Dual Mono modes (modular inputs are in a 2:1 mixer configuration).

Operational Mode Selector Choose one of three settings to meet application needs: 70V Mono, Dual Mono (4-ohm), or Stereo (4-ohm). See the sidebar on this page for description of operating modes.

Output Feeds - In mono modes, the connectors provide output signal feeds both before and after any outboard signal-processing. In stereo mode, the Pre-EQ connector provides mono mix output of the stereo input signal.

Technical Specifications, Dimensions, and Weights can be found on Page 79

Modular Amplifier

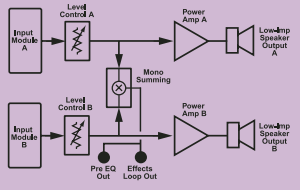
The M-Class Series of amplifiers are modular amps that can accept up to two input modules per unit. These modules offer a cost effective and convenient way to add a variety of features to a system. A balanced line input module (BAL2S) is shipped with each unit. *See page 37.*

Modes of Operation

Each model includes a 3-position switch that can be set to one of three modes of operation: Stereo mode, 70V Mono mode, or Dual Mono mode.

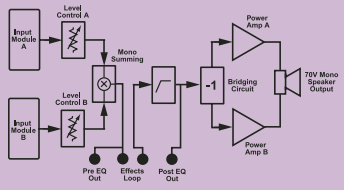
• *Stereo*

In this mode, the amp supplies two independent channels of low-impedance amplification. These channels can be used to supply left and right audio for stereo installations of 2 separate zones of amplification with different audio programs.



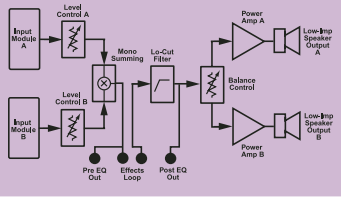
• *70V Mono*

In this mode, the amp supplies a single channel of amplification. This mode also mixes the signals from each input module into a mono program. By assigning each module to a different bus, a 2:1 mixer is formed with the front-mounted level controls adjusting the mix. In addition, one module can be set to mute the other when it is active, thereby providing an effective paging system.



• *Dual Mono*

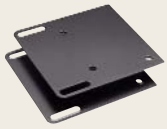
This mode is similar to the 70V Mono mode except that in this mode the amp supplies two channels of low-impedance amplification. This mode still mixes the input signal from the different modules but a Channel Balance control is provided to adjust the output levels of one channel against the other.



MODULES

Input Modules- See Page 37

Accessories



RPK86 Rear Rack Mounting Kit

PVMC Module Security Cover

Telephone Paging Amplifiers

TPU250 shown

TPU35B, TPU60B, TPU100B, TPU250

TPU15A

Bogen's TPU-Series of amplifiers are the ideal choice within the telephone paging industry. With five models to choose from, ranging in power from 15 watts to 250 watts, each model provides signal-activated, automatic muting of background music during a telephone page, and gradual return of music following a page.

Product Features:

- 15, 35, 60, 100 and 250 watt models specially designed for telephone paging systems
- 3 inputs on TPU250 and TPU-B models: 1 TEL, 1 MIC (Lo-Z), 1 AUX (Hi-Z)
- 2 inputs on TPU15A: 1 TEL, 1 AUX (Hi-Z)
- Sensitivity: 0.3 mV, MIC; -20 dBm, TEL; 85 mV, AUX
- 600-ohm balanced TEL input for direct connection to page ports and adapters
- TEL input has Automatic Level Control (ALC) for constant page announcement level
- Separate MIC input for a low-impedance push-to-talk microphone (TPU-B models only)
- Music input – mutable by external contact closure (TPU-B models only) or activity on TEL input
- Separate volume controls for mic, paging, background music, and night ringer
- Built-in night ringer can be activated from 90V ring signal (TPU-B and TPU250 models only) or external contact closure
- 25V and 70V constant-voltage outputs, balanced and unbalanced; also 8-ohm on TPU15A
- Wall-mount design provides minimum protrusion from backboard
- TPU-B models may be rack-mounted using RPK82 rack mounting kit (sold separately)
- TPU250 designed to rack mount directly, no kit necessary
- Easily accessible, recessed front-panel controls (TPU-B models only) for setting volume, muting, music, etc.
- RCA jacks provided to allow amplifier bridging to double the number of amplifier inputs and outputs (TPU-B models only); a TPU250 can only be bridged with one other TPU250
- Thermal and electronic overload protection (TPU-B models only), resettable circuit breaker (except TPU250), Slo-Blo fuse on TPU250

Specialized Telephone Input

The TPU-Series' 600-ohm transformer balanced input is perfectly suited to connect to paging ports and paging adapters such as Bogen's TAMB. Here are a few specially designed features:

- The background music will mute whenever paging activity is present on the telephone input, even if control contacts are not available. (Separate mute control contacts are also available.)
- To avoid problems with noise on the lines falsely muting the background music, a built-in VOX threshold control (not on TPU15A) lets you decide what's a real signal and what's noise.
- Because not everyone speaks at the same level, the Automatic Level Control feature keeps loud voices from booming out of the paging system's speakers.

Aphex® Aural Exciter

Crisp, clean, intelligible sound is the goal of every paging system. The Aphex® Aural Exciter circuit, which was originally developed for the recording industry, adds back the high frequency harmonics that are lost through the handsets and speakers. With one simple control, you can adjust the amount of high-frequency content the Aphex® circuit adds back until optimum intelligibility is reached.

Variable Music Mute

Add some polish to announcements by using the TPU's built-in variable mute feature. Variable mute allows you to control the level of the music heard in the background during a page. It's fully adjustable from no muting of music to full suppression of music. The TPU also gracefully fades the muted music back in after the page is finished for a smooth, professional sound (not available on TPU15A).

Bridging

Bridging two TPU amplifiers permits them to be used in tandem with one another to increase the total output power of the system, thereby permitting additional speakers to be added. For example, when two 250-watt amplifiers are bridged, the total output capacity of the system is 500 watts. Also, both amplifiers will receive the same input signal, amplify it, and deliver it to the speaker loads connected to each amplifier (not available on TPU15A).

Model	Output Power (Watts)	Inputs										Night Ringer		Outputs				
		Telephone	Music	Microphone	Adjustable Mute Threshold	Automatic Level Control	Bass/Treble Controls	Peak Level LED	Adjustable Mute Level	Fade Back From Mute	Aphex Aural Exciter	90V Activation	Contact Closure	70V	25V	25 VCT	8 Ohms	16 Ohms
TPU250	250	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
TPU100B	100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
TPU60B	60	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
TPU35B	35	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
TPU15A	15	●	●			●	*	●			●		●	●	●		●	

* *Treble Cut only*

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

WMT1A
Line-Matching Transformer

RPK82
Rack Mounting Kit (TPU-Bs only)

Pro-Matrix Series

Digitally Matrixed Pre-Amp PM3000

Digitally Matrixed Amplifier PM3180

Removable front panel for optional wall mounting

The **Pro-Matrix** products were developed expressly for the needs of restaurants, lounges, fitness centers and other venues that require numerous input sources but have areas with distinctly different audio requirements. The Pro-Matrix products provide 3 fully independent audio channels that can use any of the 6 different inputs in vastly different ways. The Pro-Matrix units are designed to be as easy for users to operate as a home stereo yet provide the installer a wide array of customizable features that are all password-protected from tampering.

General Features:

- 3 Independent audio channels
- Auto-switching of inputs based on custom assigned priorities and input audio activity
- 4 High-impedance, unbalanced auxiliary inputs
- 2 Microphone inputs; one input can be programmed to accept a telephone line for paging
- Auxiliary trim controls accommodate a wide range of auxiliary input signal levels
- Wireless infrared remote control unit
- Detachable front panel can be mounted up to 25 feet away from main unit using included accessory cable or up to 250 ft. with optional mounting kit (RMPWMK3)
- Output level metering for each audio channel
- Automatic fade-in of audio sources
- Automatic level control for microphones (selectable)
- Microphone page triggering by voice or switch (N.O. or N.C.)
- Phantom power for microphones (selectable)
- Rack mountable with kit (RPK79)

PM3180 Features:

- 100, 60, and 20 watt amplifier channels
- 8-ohm, 70V, and 25V transformer coupled outputs
- 4-ohm direct output
- Audio inserts for connection to external signal processing equipment

PM3000 Features:

- 3 Pre-amp level outputs, both balanced and unbalanced
- Ground Lift switch

Installer Programmable Features:

- Easy to understand and operate
- Large 10-character alphanumeric display with prompted programming for quick setup
- Password-protected system settings for consistent, foolproof operation
- 6 user-assigned priority levels for inputs
- Each input can be assigned different priority levels for each of the 3 output channels
- Volume and tone control lockout, independently on each audio channel
- Configure microphone input (ALC, phantom power, VOX or contact triggered)
- Preset power-up levels of each input for volume, treble, and bass
- Programmable variable music mute levels during MIC or TEL page
- Preset bass and treble response of each input for each audio channel
- Limit maximum volume level a user can achieve, programmable for each audio channel
- Large display shows currently active input source
- Create custom names for input source display

User Features:

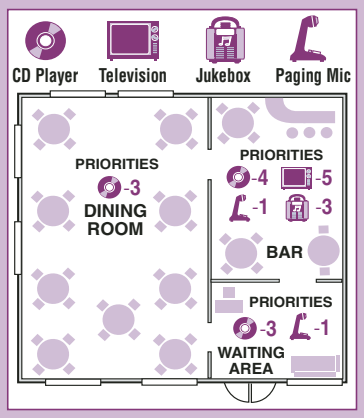
- Manual or automatic selection of input source
- Volume, bass, and treble controls for each audio channel

What Does The Pro-Matrix Do?

The Pro-Matrix products are ideally suited for restaurants and similar venues. It provides 4 AUX and 2 MIC inputs that can be distributed into 3 different zones. The Pro-Matrix automatically switches the different audio sources based on a preset, user-programmed priority hierarchy. This allows the correct audio to reach the correct areas without any user intervention, making operation ultra simple.

For example, suppose a restaurant has a dining area, lounge, and waiting area that are in need of the following audio sources:

- ***The Dining Area*** - Uninterrupted background music only, no other sources.
- ***The Bar*** - Hostess paging mic and either background music, jukebox, or TV audio.
- ***The Waiting Area*** - Hostess paging mic and background music only.



The Pro-Matrix adapts quickly to this situation. Connect each area to a different audio channel. Then connect the background music source, jukebox, and TV audio to the AUX inputs, and connect the hostess paging mic. The rest of the installation is completed using the detachable 10-character control panel. Using simple prompted programming, give each input the priority it should have relative to the other sources for each area. Undesired sources can be removed from the priority list in a particular area so they cannot cut in.

This flexible priority assignment allows all the sources needed in the lounge to be handled correctly and automatically, while the same source in the dining and waiting areas are automatically handled differently according to their needs.

In addition to flexible priority assignment of inputs, the Pro-Matrix has 10 different menus that allow control of a host of system operations from applying phantom power to mics to setting the muting level of music during mic pages and much more.

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

RMPWMK3
Remote Wall Mounting Kit for Removable Front Panel

RPK79
Rack Mounting Kit

Flexible Output Levels

The VMIX was designed to make connections to other sound system components as easy as possible. Its transformer-balanced output provides ground loop isolation and high noise immunity when connected to other balanced inputs of downstream components. This output can provide 3 distinct output voltage ranges to accommodate just about any input type from a microphone input at -50 dBµ to a professional audio input requiring +4 dBµ, as well as a more common commercial level of -10 dBµ. Setting the proper input range is as easy as moving a slide switch. The VMIX provides a separate unbalanced RCA output, which makes simple equipment interconnects a snap.

Signal-Processing Modules

When signal-processing output modules are installed into the Power Vector's last two module bays, they automatically insert themselves into the mix bus signal path leading to the output stage. When two of these output modules are installed, their effects are cascaded with the second to last bay's module processing the signal first and then passing it to the module in the last bay. Two benefits are gained by this innovation: (1) the effects insert jacks are still available for use by external processing equipment. (2) the signal-processing output modules act on the signal on the raw mix bus signal before any other user controls, like volume, bass, and treble can affect it. This then ensures that signal level dependent processors, such as the CMP1R Compressor / Limiter and the ANS1R Ambient Noise Sensor modules, perform as intended regardless of front panel control changes.

Modular Mixer

Power Vector Mixer
VMIX

AMPLIFIER VERSIONS on Pages 36 & 38

This 8-channel mixer/pre-amplifier offers a wide variety of operational features and functions for superior audio performance. Eight module bays accept plug-in modules, allowing up to four levels of priority between modules. Security covers for both the front and rear of the unit prevent tampering with settings. For large applications, several Power Vector Mixers can be bridged together.

Product Features:

- Wide selection of plug-in modules
- 8 module bays
- 2 module bays capable of handling signal-processing plug-in output modules
- 4 levels of priority between modules
- 8 inputs, with independent volume controls for each
- LED signal/clip indicator for each channel
- Bass and treble controls
- 11-segment LED output level meter monitors the output level of the mixer with Peak Hold switch
- Balanced transformer-isolated output
- Balanced output signal level switch (-50, -10, and +4 dBµ)
- Unbalanced signal output jack
- Join multiple Power Vector mixers together using bridging jack and mute terminals
- Motorized master volume control that can be remotely operated (with RVCP Remote Volume Control Panel, sold separately)
- 125 Hz Lo-cut feature (switch located in module bay 6)
- Tone control bypass switch (located in module bay 6)
- Module security cover prevents tampering with module controls (8 included)
- Resettable circuit breaker
- Grounded, unswitched AC convenience receptacle with a 500W maximum capacity provided for external equipment
- Power indicator
- Rack mountable (rack mounting kit RPK87, sold separately)
- Security cover to protect front controls and allows access to installer selected controls
- 3-year warranty

ALL MODULES SOLD SEPARATELY

Technical Specifications, Dimensions, and Weights can be found on Page 79

Accessories

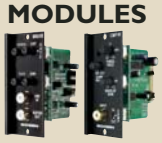
PVMC
Module Security Cover

PVSC
Power Vector Security Cover

RVCP
Remote Volume Control Panel

RPK87
Rack Mounting Kit

MODULES



Input & Signal-Processing Modules- See Pages 37 & 38

Mixers

MIC/LINE Mixers
CAM8/CAM8PRO

The Bogen **CAM8** and **CAM8PRO** are 8-input, dual-bus MIC/Line mixers that combine superb performance with a generous array of simple-to-use features in a single-rack space design. Both models feature 8 independently assignable inputs switchable between MIC and Line. Each input has a trim control, a switchable low-cut filter, and a Main/Auxiliary bus output selector. Phantom Power is provided for condenser microphones. Solidly engineered, the Bogen CAM8 and CAM8PRO mixers will provide many years of trouble-free operation.

The CAM8PRO also features a built-in Compressor/Limiter with adjustable Threshold and Ratio Controls; a Bar Graph Output Meter that indicates input signal levels; and a headphone jack.

CAM8 & CAM8PRO Product Features:

- 8 independently assignable inputs
- Dual-bus design with Main/Aux output selector for each input
- Pluggable terminal strip connections
- Separate Auxiliary input
- Balanced inputs and outputs
- Direct bus connection for cascading multiple mixers
- MIC/Line switch for each input and Main output
- Gain/Trim Control for each input
- Low-Cut Filter for each input
- Switchable Phantom Power for condenser MIC inputs
- Input Level Control knob for each input
- Output Level Control knob for Main and AUX outputs
- Sealed potentiometers for low noise, long life
- Heavy-duty construction
- External power supply
- Single-rack space

CAM8PRO Added Features:

- Compressor/Limiter (Main output)
- Compressor/Limiter Bypass switch
- Adjustable Threshold and Ratio Controls
- LED Bar Graph Output Meter (Peak or Average)
- Headphone Output

Dimensions	Product Weight
19" W x 1-3/4" H x 7-1/2" D	9 lb.

CAM8PRO Only (Shaded Areas)

Threshold Control
Sets signal level (-20 to +20VU; factory setting 0VU) at which the Compressor/Limiter becomes active.

Ratio Control
Sets the amount of compression (0 to100%; the factory setting is 100%) of the signal above the threshold.

LED Bar Graph Output Meter
Displays output level in dB, ranging from -18 (green) to +12 (red). This meter can be set to indicate average or peak level of the Main or AUX bus.

Compressor/Limiter Switch & LED
Reduces clipping distortion at the main output. The brighter the LED, the more the signal is being compressed.

Main/Auxiliary Bus Selector (one per channel)
Allows an input to be routed to Main, AUX, both, or neither.

Channel Volume Control Knob (one per channel)

Front Panel

Headphone Jack

Low Cut Switch (one per channel)
Helps eliminate low frequency noise.

Main Output Volume Control Knob
Controls the output signal volume of the Main bus. CAM8PRO Compressor/Limiter only works on Main bus.

Auxiliary Output Volume Control Knob
Controls the output signal volume of the Aux bus (and headphones for CAM8PRO).

Power Button & Indicator LED

Rear Panel

AC Power Jack

Ground Connection

Phantom Power Switch

Auxiliary Bus Output

Main Output MIC/Line Switch

Main Bus Output

Direct Mix Bus Input

Pluggable Terminal Strips Inputs

Input Pad MIC/Line Switch (one per channel)

Input Gain/Trim Control (one per channel)

Mixers

MIC/LINE Mixers
CAM2 Mixer/Pre-Amplifier

The CAM2 is a 5-input mixer/pre-amplifier that meets a wide variety of applications and is particularly well-suited for expanding the number of inputs on Bogen or other public address amplifiers. The CAM2 provides four professional, low-impedance, balanced microphone inputs through XLR connectors and one auxiliary input.

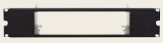
Individual phantom power switches for each input allow the use of both dynamic and condenser microphones on the same unit. A bridging input permits simple interconnection of multiple CAM2 mixers for system expansion without the need to sacrifice any mixer inputs. Clipping indicators for each input and an output level meter provide information to the system operator about sound integrity. Wide frequency response, low distortion, low-noise, and high channel crosstalk isolation ensure superior sound quality. The CAM2's balanced mixer output can be switched between line level (+4 dBµ) or microphone level (-50 dBµ) for compatibility with a wide range of sound processing equipment.

Product Features:

- 4 Microphone inputs
- Low-impedance, balanced microphone inputs
- 1 High-impedance auxiliary input
- Low-noise, active mixing
- Master volume control
- Input clipping indicator for each channel
- 5 Segment LED output level meter
- XLR microphone input connectors
- Phantom power selectable per mic input
- Unbalanced line level output
- Balanced XLR output
- Illuminated power switch
- Switchable output level (+4/-50 dBµ)
- UL and C-UL listed
- Compact size
- Bridging input for connecting together multiple CAM2 mixers
- Rack- or wall-mounted with RPK35B or WMK1

Dimensions	Product Weight
11-3/8" W x 2-5/8" H x 7-3/8" D	3 lb.

Accessories



RPK35B
Rack Mounting Kit

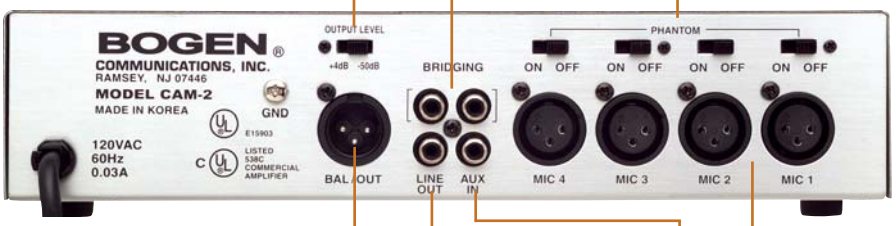
WMK1
In-Wall Mounting Kit

Output Level Switch - Switch changes the nominal signal level of the XLR output from +4 dB to -50 dB.

Bridging - The bridging jacks facilitate the connecting together of mixers to obtain additional inputs without using any of the CAM2's inputs.

Phantom Power - The CAM2 provides power for electret condenser microphones. The Phantom ON/OFF switch controls the applications of DC voltage to each MIC input.

Rear Panel



Output XLR Connector - Provides a balanced output compatible with most professional equipment.

Line Output Connector (Line Out) - RCA jack provides unbalanced output signal compatible with most amplifiers, recording equipment, and other audio equipment. Not affected by Output Level switch.

Auxiliary Input (AUX In) - A dedicated unbalanced auxiliary input for tuner, tape deck, CD player, etc.

MIC Inputs - Balanced MIC level XLR inputs.

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— SEE PAGE 81 FOR DETAILS

AMPLIFIER FEATURES CHART

Amplifier Output Power Rating/ Channel	Model Numbers	Amp Channels	Input Types					Signal Processing						Music Muting			MOH Output	Night Ringer	Remote Volume	Output Meter	Mounting			Page Number
			TEL Input* 600-ohm Balanced	MIC Inputs* Lo-Z Balanced	AUX Inputs* Hi-Z Unbalanced	Balanced Inputs Hi-Z	Modular Inputs	Aphex Aural Exciter	Loudness Contour	ALC	EQ	Bass/Treble	Tone Control	Variable Mute	Auto Mute	Manual Mute					Wall Mount	Shelf Mount	Rack Mount	
1.5W	GA2	1			1																●	●		40
6W	GA6A	1		1	1								●									●		40
10W	C10	1	1	2 (1)	0 (1)								●		●	●					K	●	K	40
10W	C10MOH	1	1	2 (1)	0 (1)								●		●	●	●				K	●	K	40
15W	TPU15A	1	1		1					●			●		●			⊗			●			44
20W	C20	1	1	2 (1)	0 (1)								●		●	●					K	●	K	40
20W	C20MOH	1	1	2 (1)	0 (1)								●		●	●	●				K	●	K	40
35W	C35	1	1	2 (1)	1 (2)							●			●	●						●	K	40
35W	GS35	1	0 (1)	6 (4)	1 (2)			●	●	●	●			●	●	●			●			●	K	39
35W	TPU35B	1	1	1	1			●		●		●		●	●	●		●			●		K	44
35W	V35	1	●	●	●	●	8			●	●	●		●	●				●	●		●	K	36
60W	BPA60	1			◐																	●	K	41
60W	C60	1	1	2 (1)	1 (2)							●			●	●						●	K	40
60W	GS60	1	0 (1)	6 (4)	1 (2)			●	●	●	●			●	●	●			●			●	K	39
60W	TPU60B	1	1	1	1			●		●		●		●	●	●		●			●		K	44
60W	V60	1	●	●	●	●	8			●	●	●		●	●				●	●		●	K	36
100W	C100	1	1	2 (1)	1 (2)							●			●	●						●	K	40
100W	GS100	1	0 (1)	6 (4)	1 (2)			●	●	●	●			●	●	●			●			●	K	39
100W/60W/20W	PM3180	3	0 (1)	2 (1)	4					●		●		●	●	●			●	●		●	K	45
100W	TPU100B	1	1	1	1			●		●		●		●	●	●		●			●		K	44
100W	V100	1	●	●	●	●	8			●	●	●		●	●				●	●		●	K	36
100W	WV100	1	●	●	●	●	8			●	●	●		●	●				●	●	K			38
125W	HTA125A	1			◐																	●	●	41
150W	GS150	1	0 (1)	6 (4)	1 (2)			●	●	●	●			●	●	●			●			●	K	39
150W	V150	1	●	●	●	●	8			●	●	●		●	●				●	●		●	K	36
150W	WV150	1	●	●	●	●	8			●	●	●		●	●				●	●	K			38
250W	GS250	1	0 (1)	6 (4)	1 (2)			●	●	●	●			●	●	●			●			●	K	39
250W	HTA250A	1			◐																	●	●	41
250W	TPU250	1	1	1				●		●		●		●	●	●		●			●		●	44
250W	V250	1	●	●	●	●	8			●	●	●		●	●				●	●		●	K	36
250W	WV250	1	●	●	●	●	8			●	●	●		●	●				●	●	K			38
300/600W	M300	2/1	●	●	●	2†	2			●				●	●							●	●	43
300W	X300	2				2																●	●	42
450/900W	M450	2/1	●	●	●	2†	2			●				●	●							●	●	43
450W	X450	2				2																●	●	42
600/1200W	M600	2/1	●	●	●	2†	2			●				●	●							●	●	43
600W	X600	2				2																●	●	42

● Feature Included

● Features determined by type of module installed

◐ Balanced input available with accessory plug-in transformer (TL100 or TL600)

K Accessory kit required for mounting

⊗ Contact closure activation only

* Some inputs are switch selectable. The number in parentheses shows the maximum number of inputs when switched.

† BAL2S balanced input module included standard; uses one modular input bay.

Specifications subject to change without notice.

AMPLIFIER SPECS CHART

Model Numbers	Amplifier Output Power Rating/Channel	Channels	Frequency Response*	Distortion**	Speaker Outputs	AC Line Draw***	Dimensions	Product Weight
BPA60	60W	1	50 Hz to 15 kHz	2% Max	8-ohm/25V, 16-ohm, 25VCT, 70V	180W	15-1/4" W x 3-1/2" H x 8-1/4" D	17 lb.
C10	10W	1	70 Hz to 16 kHz	1% Max	70V, 25V, 16-ohm, 8-ohm, 4-ohm	38W	11-3/8" W x 2-7/8" H x 7-3/8" D	5 lb.
C10MOH	10W	1	70 Hz to 16 kHz	1% Max	70V, 25V, 16-ohm, 8-ohm, 4-ohm	38W	11-3/8" W x 2-7/8" H x 7-3/8" D	5 lb.
C20	20W	1	70 Hz to 16 kHz	1% Max	70V, 25V, 16-ohm, 8-ohm, 4-ohm	50W	11-3/8" W x 2-7/8" H x 7-3/8" D	6 lb.
C20MOH	20W	1	70 Hz to 16 kHz	1% Max	70V, 25V, 16-ohm, 8-ohm, 4-ohm	50W	11-3/8" W x 2-7/8" H x 7-3/8" D	6 lb.
C35	35W	1	70 Hz to 16 kHz - Transformer; 20 Hz to 20 kHz - Direct	1% Max	70V, 25V, 16-ohm, 4-ohm direct	85W	14-1/2" W x 3-3/4" H x 11" D	16 lb.
C60	60W	1	70 Hz to 16 kHz - Transformer; 20 Hz to 20 kHz - Direct	1% Max	70V, 25V, 16-ohm, 4-ohm direct	148W	14-1/2" W x 3-3/4" H x 11" D	18 lb.
C100	100W	1	70 Hz to 16 kHz - Transformer; 20 Hz to 20 kHz - Direct	1% Max	70V, 25V, 16-ohm, 4-ohm direct	220W	14-1/2" W x 3-3/4" H x 11" D	20 lb.
GA2	1.5W	1	200 Hz to 15 kHz	2% Max	8- & 600-ohm	4W	5-1/2" W x 4-1/8" H x 2-1/4" D	2 lb.
GA6A	6W	1	30 Hz to 12 kHz	2% Max	70V, 25V, 8-ohm	16W	8-1/2" W x 2-3/4" H x 6" D	5 lb.
GS35	35W	1	65 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% Max	70V, 25V, 25VCT, 8-ohm, 4-ohm direct	0.9A	16-1/2" W x 3-1/2" H x 13-1/2" D	17 lb.
GS60	60W	1	65 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% Max	70V, 25V, 25VCT, 8-ohm, 4-ohm direct	1.3A	16-1/2" W x 3-1/2" H x 13-1/2" D	20 lb.
GS100	100W	1	65 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% Max	70V, 25V, 25VCT, 8-ohm, 4-ohm direct	2.2A	16-1/2" W x 3-1/2" H x 13-1/2" D	23 lb.
GS150	150W	1	65 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% Max	70V, 25V, 25VCT, 8-ohm, 4-ohm direct	3.0A	16-1/2" W x 3-1/2" H x 13-1/2" D	29 lb.
GS250	250W	1	65 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% Max	70V, 25V, 25VCT, 8-ohm, 4-ohm direct	5.0A	16-1/2" W x 3-1/2" H x 13-1/2" D	30 lb.
HTA125A	125W	1	20 Hz to 20 kHz	0.5% Max	70V, 25VCT, 25V, 8-ohm, 4-ohm	260W	19" W x 5-1/4" H x 11" D	36 lb.
HTA250A	250W	1	20 Hz to 20 kHz	0.5% Max	70V, 25VCT, 25V, 8-ohm, 4-ohm	520W	19" W x 5-1/4" H x 11" D	50 lb.
M300	300/600W	2 or 1	20 Hz to 20 kHz	0.5% Max	4- to 8-ohm (2 channel mode); 70V (1 channel mode)	12A	17" W x 3-1/2" H x 18-1/2"D (not including brackets)	41 lb.
M450	450/900W	2 or 1	20 Hz to 20 kHz	0.5% Max	4- to 8-ohm (2 channel mode); 70V (1 channel mode)	15A	17" W x 3-1/2" H x 18-1/2"D (not including brackets)	44 lb.
M600	600/1200W	2 or 1	20 Hz to 20 kHz	0.5% Max	4- to 8-ohm (2 channel mode); 70V (1 channel mode)	20A	17" W x 3-1/2" H x 18-1/2"D (not including brackets)	46 lb.
PM3180	100W, 60W, 20W	3	70 Hz to 20 kHz - Trans (Amp 1 & 2); 70 Hz to 15 kHz - Trans (Amp 3); 20 Hz to 20 kHz - Direct (Amp 1 & 2); 20 Hz to 15 kHz - Direct (Amp 3)	0.5% - Amp 1&2; 1% - Amp 3 (Max)	70V, 25V, 8-ohm, 4-ohm direct	430W	17" W x 5-1/2" H x 12-1/2" D	38 lb.
TPU15A	15W	1	70 Hz to 12 kHz	2% Max	70V, 25V, 8-ohm	48W	11" W x 2-3/4" H x 2-3/8" D	4 lb.
TPU35B	35W	1	70 Hz to 15 kHz	1% Max	70V, 25V, 25VCT, 16-ohm	0.7A	14-1/4" W x 8-3/8" H x 3-5/8" D	13 lb.
TPU60B	60W	1	70 Hz to 15 kHz	1% Max	70V, 25V, 25VCT, 16-ohm	1.5A	14-1/4" W x 8-3/8" H x 3-5/8" D	15 lb.
TPU100B	100W	1	70 Hz to 15 kHz	1% Max	70V, 25V, 25VCT, 16-ohm	2A	14-1/4" W x 8-3/8" H x 3-5/8" D	18 lb.
TPU250	250W	1	70 Hz to 15 kHz	1% Max	70V, 25V	5A	19" W x 10-1/2" H x 3-7/8" D	30 lb.
V35	35W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	0.6A	16-1/2" W x 3-1/2" H x 12" D	24 lb.
V60	60W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	1.3A	16-1/2" W x 3-1/2" H x 12" D	28 lb.
V100	100W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	2.0A	16-1/2" W x 3-1/2" H x 12" D	32 lb.
V150	150W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	3.5A	16-1/2" W x 3-1/2" H x 12" D	35 lb.
V250	250W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	5.5A	16-1/2" W x 3-1/2" H x 12" D	40 lb.
WV100	100W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	2.0A	14-1/8" W x 21" H	27 lb.
WV150	150W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	3.5A	14-1/8" W x 21" H	29 lb.
WV250	250W	1	45 Hz to 20 kHz - Transformer; 20 Hz to 20 kHz - Direct	0.5% - Transformer; 0.1% - Direct (Max)	70V, 25V, 8-ohm, 4-ohm direct	5.5A	14-1/8" W x 21" H	28 lb.
X300	300W	2	20 Hz to 20 kHz	0.5% Max	70V direct	12A	17" W x 3-1/2" H x 18-1/4"D (not including brackets)	41 lb.
X450	450W	2	20 Hz to 20 kHz	0.5% Max	70V direct	15A	17" W x 3-1/2" H x 18-1/4"D (not including brackets)	44 lb.
X600	600W	2	20 Hz to 20 kHz	0.5% Max	70V direct	20A	17" W x 3-1/2" H x 18-1/4"D (not including brackets)	46 lb.

*@ -2 dB FRP Transformer output; @ FRP for Direct outputs

** Bandwidth limited to frequency response

***FRP @ 120V AC line voltage

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